

In re Patent Application of

MARSHALL et al

Serial No. 10/520,849

Filed: January 11, 2005

Title: PHOTODETECTOR CIRCUITS

NIXON VANDERHYE PC Fax 703+816+4100

Atty SCS-124-1102

Dkt.

C# M#

TC/A.U. 2814

Examiner: M. Pizarro Crespo

Date: May 30, 2008

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May 30 2008 03:29pm P001/007

**FACSIMILE CERTIFICATE**

I hereby certify that this Petition to the Commissioner is being transmitted by facsimile to the Patent and Trademark Office on May 30, 2008, specifically to 571-273-8300.

**MAY 30 2008**

Signature

Stanley C. Spooner  
Reg. No. 27,393

No. of pages transmitted (including this cover sheet): 7 pages

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**RESPONSE/AMENDMENT/LETTER**

This is a response/amendment/letter in the above-identified application and includes an attachment which is hereby incorporated by reference and the signature below serves as the signature to the attachment in the absence of any other signature thereon.

**Petition to the Commissioner attached.**

**Fees are attached as calculated below:**

Total effective claims after amendment 0 minus highest number  
previously paid for 20 (at least 20) = 0 x \$50.00 \$0.00 (1202)/\$0.00 (2202) \$

Independent claims after amendment 0 minus highest number  
previously paid for 3 (at least 3) = 0 x \$210.00 \$0.00 (1201)/\$0.00 (2201) \$

If proper multiple dependent claims now added for first time, (ignore improper); add  
\$370.00 (1203)/\$185.00 (2203) \$

Petition is hereby made to extend the current due date so as to cover the filing date of this  
paper and attachment(s)

One Month Extension \$120.00 (1251)/\$60.00 (2251)

Two Month Extensions \$460.00 (1252)/\$230.00 (2252)

Three Month Extensions \$1050.00 (1253)/\$525.00 (2253)

Four Month Extensions \$1640.00 (1254)/\$820.00 (2254)

Five Month Extensions \$2,230.00 (1255)/\$1115.00 (2255) \$

Terminal disclaimer enclosed, add \$130.00 (1814) / \$65.00 (2814) \$

Applicant claims "small entity" status.  Statement filed herewith

Rule 56 Information Disclosure Statement Filing Fee \$180.00 (1806) \$ 0.00

Assignment Recording Fee \$40.00 (8021) \$ 0.00

Other: \$ 0.00

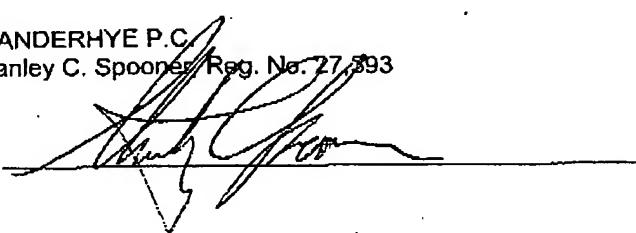
**TOTAL FEE \$ 0.00**

**CREDIT CARD PAYMENT FORM ATTACHED.**

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140. A duplicate copy of this sheet is attached.

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NIXON & VANDERHYE P.C.  
By Atty: Stanley C. Spooner, Reg. No. 27,393

Signature: 

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**MAY 30 2008**

In re Patent Application of

MARSHALL et al

Atty. Ref.: 124-1102; Confirmation No. 2698

Appl. No. 10/520,849

TC/A.U. 2814

Filed: January 11, 2005

Examiner: M. Pizarro Crespo

For: PHOTODETECTOR CIRCUITS

\* \* \* \* \*

May 30, 2008

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**PETITION TO THE COMMISSIONER**

Applicants petition the Commissioner for relief with respect to the restriction requirement set out in the *Ex parte Quayle* Action mailed March 31, 2008 (Paper No. 11). The sequence of events leading up to this restriction requirement may be considered pertinent.

**Restriction requirement mailed March 29, 2007**

In the restriction requirement mailed March 29, 2007 (Paper No. 7), the Examiner requires restriction between two groups of inventions, Group I including claims 1-17 and 24 directed to a photodetector circuit with an active electrooptical junction and Group II including claims 18-23 and 25. On page 3, section 4, the Examiner concedes that “[t]he technical feature of the Group I claims is the claimed electrooptical junction.” The Examiner’s rationale is that since an electrooptical junction is contained in the Group II claims as well and because he alleges

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that this is known in the Parker reference, there is no special technical feature linking the groups. The Examiner also contends that there are 18 separate species disclosed. It is also noted that the Examiner does not identify any generic claim in this action.

**Amendment and Response to Restriction/Election Requirement filed July 27, 2007**

In the Amendment and Response to Restriction/Election Requirement filed July 27, 2007, Applicants made amendments to the claims eliminating various improper multiple dependencies and adding to claims 12 and 15 the "insulating layer" which serves to insulate the semiconductor substrate from the readout circuitry. In the remarks portion of the Amendment, Applicants noted that the "insulating layer" was a linking feature patentable over prior art which obviates the need for any further election, and that this feature was included in independent claims 18 and 20 as well as independent claims 1, 12 and 15 and thereby was the basis for the traversal of the restriction requirement. The Amendment also includes a detailed analysis of the prior art and what is and is not shown in the prior art and respectfully traverses the restriction requirement to the alleged separate inventions of Group I and Group II.

**Official Action mailed October 17, 2007**

The first Official Action on the merits was mailed October 17, 2007 (Paper No. 9) and the Examiner acknowledges Applicants' traverse of the previous restriction requirement. On page 3, line 2, the Examiner admits that "[c]urrently claims 1 and 12 are generic claims to all the species." A copy of claims 1 and 12 along with claim 15 is attached below, with common portions of all three claims printed in bold.

The Examiner alleges that "[t]here is no recitation whatsoever in any of claims 12, 15 and 20 of an APD [avalanche photodiode] in a substrate together with readout circuitry." Based

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upon this finding, the Examiner concludes that unity of invention is lacking and therefore the requirement between species is proper and made final.

The dichotomy of claims 1 and 12 admitted by the Examiner to be generic, but with the Examiner finding that claims 12, 15 and 20 lack an avalanche photodetector in a substrate together with readout circuitry is noted.

**Amendment filed February 19, 2007**

In the Amendment filed February 19, 2007, Applicants amended claim 1 to include the allowable subject matter of claim 4 into generic claim 1 and therefore all pending claims were believed allowable, with the exception of non-elected species claims 15-17.

In view of the indication of allowance of generic claims 1 and 12, Applicants suggested that because claims 15-17 were directed to non-elected species, they should nonetheless be considered in the Official Action. The current language of claims 1, 12 and 15 is attached as an exhibit with the common language among these claims in bold text.

**Ex parte Quayle Action mailed March 31, 2008**

The current Quayle Action treats claims 1-3 and 5-17. Claims 1-3 and 5-14 are allowed, but the Examiner alleges that claims 15-17 are "directed to non-elected species of the claimed invention." (See the last sentence on page 2 and the first sentence in section 7 on page 3). The Examiner admits that "[o]nce a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable." If the provisions of 35 USC §121 are no longer applicable, claims 15-17 (previously admittedly directed to non-elected species) must be considered, not only because generic claims 1 and 12 have been allowed, but claim 15 is also believed generic and claims 15-17, directed towards the previously non-elected species, remain in this application

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based upon the "withdrawal of the restriction requirement" and thus withdrawal of the provisions of 35 USC §121.

The above-noted facts are believed clearly set forth in the present written record. It should be noted that, by observing the bolded portion of allowed claims 1 and 12 and alleged withdrawn claim 15 that all of the claims are directed to the same combination. The only differences are in the description of the "photodiode detector." It is noted that allowed generic claim 12 and "restricted out" generic claim 15 are both directed to "a photodetector circuit including a photodetector and associated readout circuitry, the circuit comprising a semiconductor . . . substrate . . . supporting and electrically insulated from the readout circuitry by an insulating layer and the photodiode detector . . ." Claim 12 recites the photodiode detector is comprised of elements which "form a diode" and claim 15 recites the photodiode detector is as "having an active electrooptical junction."

The Examiner alleges that there is no recitation in claims 12 and 15 of an avalanche photodiode (page 4 of the Official Action mailed October 17, 2007). There is no requirement of an avalanche photodiode (APD) for allowability – Note that claim 12 contains no such reference and yet is still considered patentable over the art and generic. If claim 12 does not have an APD and is allowed as a generic claim, the failure to also consider and allow generic claim 15 is inconsistent. Note also, that generic claim 15, like allowed claim 1, recites the preamble from claim 1 and specifies that the photodiode detector, like claim 1 is an "electrooptical junction."

It is submitted that the Examiner has committed reversible error in maintaining that claims 15-17 are withdrawn, when in fact "[o]nce a restriction requirement is withdrawn, the

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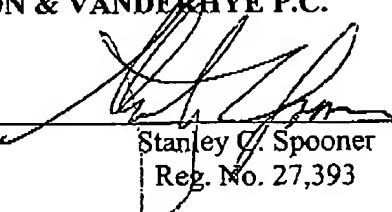
provisions of 35 U.S.C. 121 are no longer applicable" and thus there is no current basis for withdrawal of any pending claims.

Having responded to all objections and rejection set out in the outstanding official action, it is submitted that claims 1-3 and 5-17 are allowable and notice to that effect is respectfully requested. In the event the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of all claims, he is respectfully requested to contact applicant's undersigned representative.

Respectfully submitted,

NIXON & VANDERHVE P.C.

By:

  
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Attachment:

Claims 1, 12 and 15

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1. A photodetector circuit including a photodiode detector and associated readout circuitry, the circuit comprising a semiconductor handle substrate of one conductivity type supporting the readout circuitry, and an insulating layer on the handle substrate electrically insulating the readout circuitry from the substrate, and the photodiode detector comprising an avalanche photodiode having a first active region of the opposite conductivity type to the handle substrate incorporated in the handle substrate and a second active region of said one conductivity type incorporated in the handle substrate so as to define an active electrooptical junction within the handle substrate between the first and second active regions, wherein there is at least one epitaxial layer on the first active region to provide a resistance in series with the photodiode detector to control the voltage characteristic of the photodiode detector.

12. A photodetector circuit including a photodiode detector and associated readout circuitry, the circuit comprising a semiconductor handle substrate of one conductivity type supporting and electrically insulated from the readout circuitry by an insulating layer, and the photodiode detector comprising a first active region of the opposite conductivity type to the handle substrate incorporated in the handle substrate, a second active region of said one conductivity type incorporated in the handle substrate so that the first and second active regions form a diode, and at least one epitaxial layer on the substrate providing a resistance in series with the diode to control the current-voltage characteristic of the diode.

15. A photodetector circuit including a photodiode detector and associated readout circuitry, the circuit comprising a semiconductor substrate supporting and electrically insulated from the readout circuitry by an insulating layer, and the photodiode detector having an active electrooptical junction incorporated in a thinned portion of the substrate so as to detect light which is incident on a back surface of the substrate and which is not received by the readout circuitry.